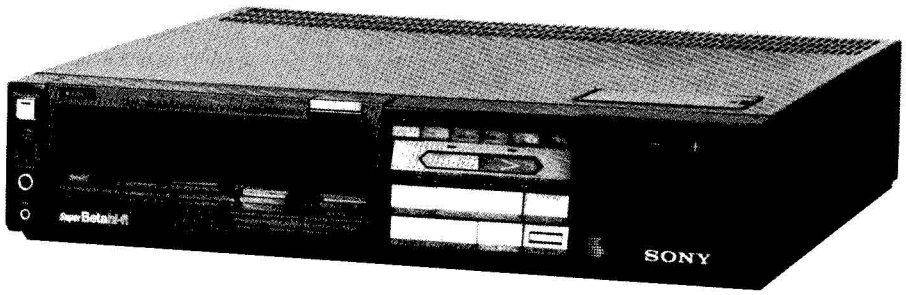
SL-HF950ES/E
RMT-223

AEP Model
E Model



SuperBetahi-fi

September, 1985

CX CHASSIS

SPECIFICATIONS

System

Video recording system
Rotary two-head helical scanning

Audio recording system
Beta hi-fi PAL system (2 channels)
(Recording on the conventional audio track is monaural.)

Video signal
SL-HF950ES
CCIR standards, PAL and DDR SECAM colour
SL-HF950E
CCIR standards, PAL colour

Aerial input
75-ohm, asymmetrical aerial socket

Stereo/bilingual system (SL-HF950ES only)
West-German two-carrier system

Channel coverage
SL-HF950ES
VHF: Western European channels E2 - U20
UHF: Western European channels E21 - E68
(Up to 30 programmes can be preset.)
SL-HF950E
VHF: Western European channels E2 - E12
UHF: Western European channels E21 - E68
(Up to 30 programmes can be preset.)

RF output signal
UHF channels E30 to E39 (variable)
75 ohms, unbalanced

Video

Horizontal resolution
280 lines (Super Beta PRO mode)

Beta hi-fi PAL sound

Frequency response
20 Hz to 20 kHz (MPX FILTER OFF)

Wow and flutter
Less than 0.005 % WRMS

Dynamic range
More than 80 dB

Inputs and outputs

Video input
VIDEO IN: BNC connector
1.0 V (p-p) $^{+1.0}_{-0.5}$ V (p-p)
75 ohms, unbalanced, sync negative

Video output
VIDEO OUT: BNC connector
1.0 V (p-p) ±0.1 V (p-p)
75 ohms, unbalanced, sync negative

Audio inputs
AUDIO IN: 2 phono jacks
47 kilohms, −10 dBs
(0 dBs = 0.775 V rms)
Microphone: −60 dBs, for low-impedance microphone

— Continued on page 2 —

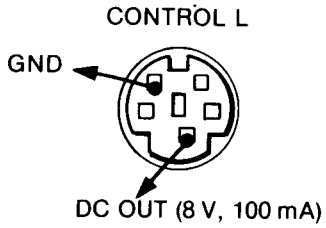
Beta
VIDEO CASSETTE RECORDER

SONY®

MICROFILM

Consumer VIDEO

Audio outputs AUDIO OUT : 2 phono jacks
Load impedance less than 10 kilohms
−10 dBs with 47 kilohms load, unbalanced
Headphones : Stereo phone jack
−26 dBs, 8 ohms
Video/audio output
21-pin EUROCONNECTOR
CONTROL S input
Minijack
CONTROL L input/output
5-pin connector



Tape transport
Tape speed 18.73 mm/sec.
Maximum recording time
2 hours 10 min. (with Sony L-500 cassette)
3 hours 15 min. (with L-750)
Fast forward/rewind time
Within 5 min. (with L-500)

Timer
Clock Crystal lock
Time indication
24-hour cycle
Timer setting Only for recording
6 events/3 weeks, adjustable for any day or for all 7 days of the week or for every week

General
Power requirements
110 - 240 V AC ± 10 %, 50/60 Hz
Power consumption
SL-HF950ES : 39 W
SL-HF950E : 36 W
Storage temperature
−20° C to +60° C (−4° F to +140° F)
Operating temperature
5° C to 40° C (41° F to 104° F)
Dimensions Approx. 430 × 95 × 405 mm (w/h/d)
(17 × 3 3/4 × 16 inches)
including projecting parts and controls
Weight Approx. 10.5 kg (23 lbs) net

Accessories supplied
Video cassette tape (1)
75-ohm coaxial cable for recorder to TV connection (1)
Remote Commander RMT-223 with two IEC designation R6 batteries (1)
RF channel adjustment screwdriver (1)

Design and specifications subject to change without notice.

Note
This appliance conforms with EEC Directives 76/889 and 82/499 regarding interference suppression.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

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SECTION 1
GENERAL

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

NOTE ON THE SL-HF950ES AND SL-HF950E

This instruction manual covers the SL-HF950ES and SL-HF950E.
The principal differences between the models are indicated in the following table. The differences are clearly mentioned in the text required.

	SL-HF950ES	SL-HF950E
Colour system	PAL and SECAM DDR	PAL
TV channel coverage	VHF E2 - U20 UHF E21 - E68	VHF E2 - E12 UHF E21 - E68
Stereo/bilingual TV programme reception	Provided	Not provided

The illustrations used in this manual are of the SL-HF950ES.

1-1. PRECAUTIONS

On safety
- This unit operates on 110 - 240 V ac, 50/60 Hz.
- Should any solid object or liquid fall into the cabinet, turn off the unit and have it checked by qualified personnel before operating it any further.
- To disconnect the mains lead (ac power cord), pull it out by the plug. Never pull the lead itself.
- The unit is not disconnected from the mains (ac power source) as long as it is connected to the mains outlet, even if the unit itself has been turned off.

On installation
- Allow adequate air circulation to prevent internal heat build-up. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation grille.
- Do not install the unit near heat sources such as radiators or air ducts or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- The unit is designed for operation in a horizontal position. Do not install it in an inclined position.
- Keep the unit and cassette tapes away from equipment with strong magnets, such as a microwave oven, large loudspeakers, etc.

On operation
- When the unit is not to be used for a long period, turn the unit off to conserve energy and to extend the useful life of your unit.
- Remove and store video cassettes after recording or playback. Always store the cassette in its case to keep the tape away from dust.

On cleaning
Clean the cabinet, panel and controls with a dry soft cloth. Do not use a moistened cloth or any type of solvent, such as alcohol or benzine, which might damage the finish.

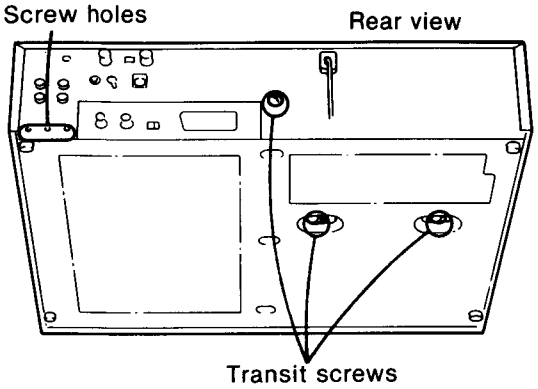
On repacking
Do not throw away the carton and packing materials. They make an ideal container in which to transport the unit. When shipping the unit to another location, repack it as illustrated on the carton.

On colour broadcasting systems
This machine is designed to record and play back using the PAL colour system (SL-HF950E) or the PAL and DDR SECAM colour systems (SL-HF950ES). Recording and playback of video sources based on other colour systems cannot be guaranteed.

If you have any questions about this unit, contact your Sony dealer.

REMOVAL OF THE TRANSIT SCREWS

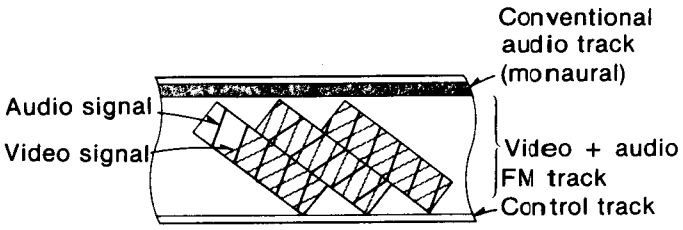
The cassette compartment is secured with three transit screws to prevent it from sliding out while the unit is being transported.
Before operating the unit, be sure to remove the transit screws, using a screwdriver. Store the screws in the screw holes at the rear, and put them back in the original positions when transporting the unit.



1-2. TECHNICAL INFORMATION

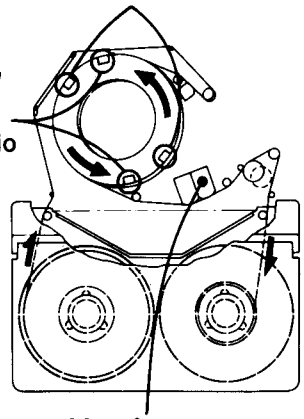
HIGH QUALITY SOUND

What is Beta hi-fi PAL recording?
In conventional recording, audio signals are recorded on the audio track and the video signals on the video track. On Beta hi-fi recording, audio signals are recorded on the video track together with the video signals.
In this recorder's Beta hi-fi PAL system, audio signals are recorded first, using the 2 audio heads, then video signals are recorded over the audio signals with an azimuth offset, using the 2 video heads.
Beta hi-fi audio signals are frequency-modulated and recorded on 2 channels, so you can record a stereo or bilingual programme with sound clearly superior to that of a conventional audio recording.



Video heads
For recording/playback of video signals

Audio heads
For recording/playback of Beta hi-fi audio signals



Audio/control heads
For recording/playback of conventional audio signals and control signals

Beta hi-fi recording on this recorder
This recorder simultaneously records audio signals on the video track (Beta hi-fi recording) and on the conventional audio track (in monaural), so that tapes recorded with this recorder can be played back on an ordinary video cassette recorder without a Beta hi-fi system.

HIGH QUALITY PICTURE

—Technology behind Super Beta (PAL)

Super Beta standard mode

Betamax provides a high-resolution picture thanks to its high relative tape-to-head speed produced with the large diameter head drum.

Super Beta standard mode offers even sharper and detailed picture reproduction by improving the emphasis characteristics of video signals in recording and the noise canceller characteristics in playback.

Super Beta PRO mode

In addition to the technology mentioned above, with the use of the highest-grade tape, the FM carrier frequency of the luminance signal is shifted up by 500 kHz. The results are higher resolution of the picture and improved signal-to-noise ratio of the chrominance signal. (Fig. 1)

Other technical extras

This SL-HF950ES/E employs a compression circuit for recording current of the chrominance signal for better signal-to-noise ratio. (Fig. 2) In addition, the newly developed "DA (Double Azimuth) PRO 4 HEAD" reduces interference between adjacent video tracks resulting in higher quality picture reproduction. These technologies contributes to overall picture quality of the SL-HF950ES/E.

Notes

- Super Beta PRO mode must be used with highest-grade tapes such as Sony PRO-X or equivalent tapes from other tape manufacturers.
- The tapes recorded in Super Beta should be played back in Super Beta mode.

Fig. 1 Frequency response

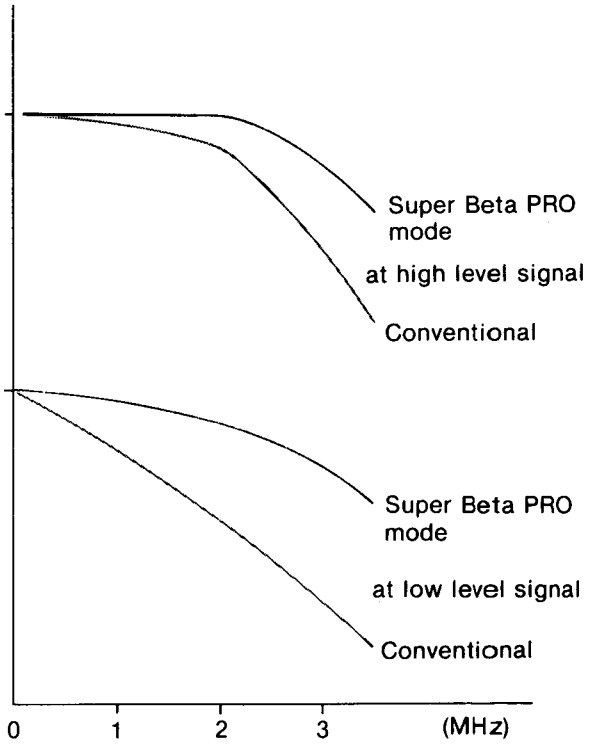
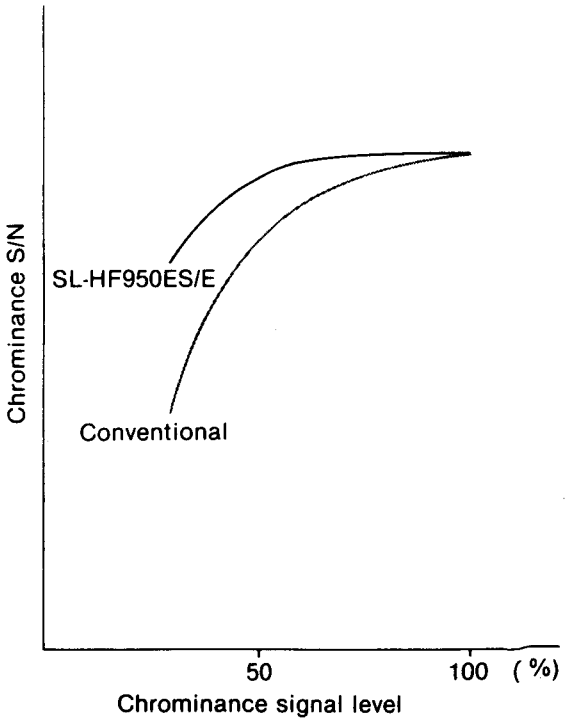
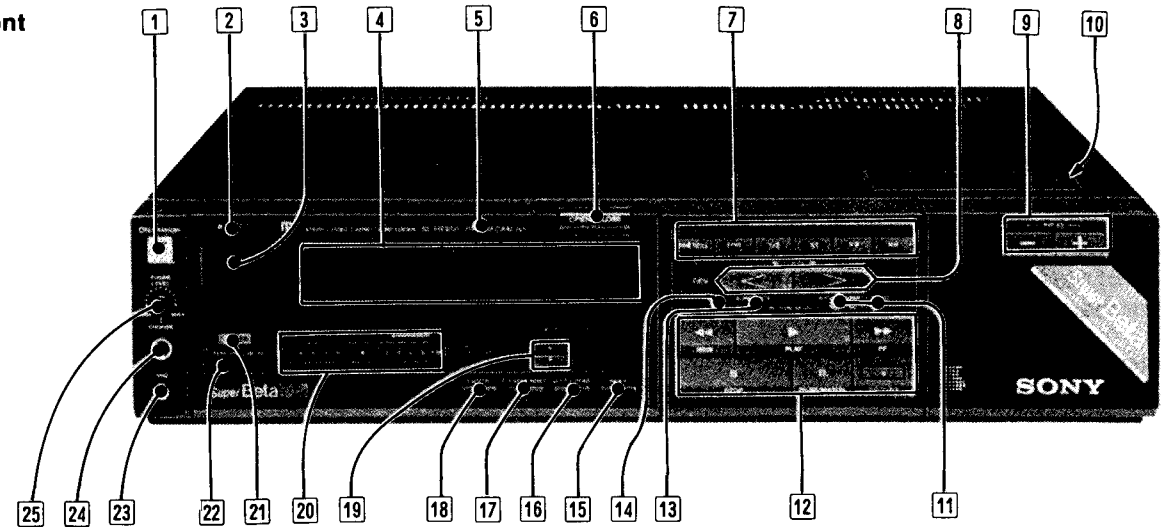


Fig. 2 Chrominance signal-to-noise ratio



1-3. LOCATION AND FUNCTION OF CONTROLS

Front

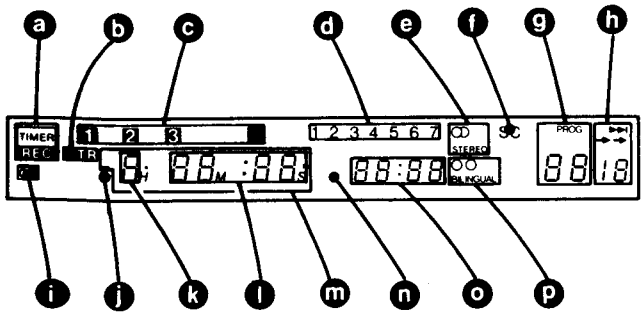


1 ON/STANDBY switch and indicator
Press to turn on the unit. The indicator will light up. Press again to turn it off.
The timer section will continue to operate and the time will be displayed even if the ON/STANDBY switch is off.

2 ⏏ EJECT button
Press to remove the cassette. This button does not function when the recorder is turned off.

3 REMOTE SENSOR
Detects the remote control signal transmitted from the supplied Remote Commander.

4 Display window



- **a TIMER REC indicator:** Shows the recorder is in timer standby mode. It is also displayed during timer recording including quick timer recording.
- **b VTR indicator:** Shows the recorder is in VTR mode.
- **c Week indicators:** Show the week in which the timer recording will take place. See page 25.
- **d Day of the week indicators**
- **e STEREO indicator (SL-HF950ES only):** Shows a stereo broadcast is being received.
- **f SC (simulcast) indicator:** Shows the INPUT SELECT switch is set to SIMUL.
- **g PROG (programme) number:** Shows the programme number selected with the PROG +/– buttons. When the INPUT SELECT switch is set to LINE/PCM, the indication will change to "AU".
- **h Index indicators:** Appear when the index function is activated. See page 22.
- **i Cassette indicator:** Shows a cassette is inserted.
- **j Turn-on time setting indicator**
- **k Event number**
- **l Turn-on time** of a timer recording
- **m Time counter:** Shows the approximate tape running time.
- **n Turn-off time setting indicator**
- **o Clock/turn-off time:** Normally shows the current time. Shows the turn-off time of a timer recording during timer setting and checking.
- **p BILINGUAL indicator (SL-HF950ES only):** Shows a bilingual broadcast is being received.

5 Cassette compartment
The compartment slides out when the ⏏ EJECT button or the ▼ OPEN/CLOSE button is pressed. To slide it in, press the ▼ OPEN/CLOSE button.

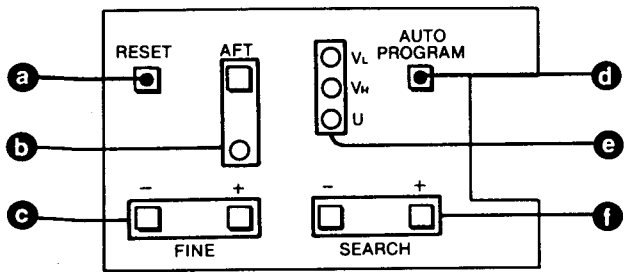
6 ▼OPEN/CLOSE button
Press to slide out the cassette compartment regardless of whether the tape is running or not. Press again to slide in the cassette compartment.

[7] **Variable speed playback buttons and indicators**
During playback (in normal, still, fast motion or slow motion picture mode), press one of these buttons to select the desired playback speed. The indicator on the button lights. When the indicator of the > FWD FRAME button lights, the picture advances. When the indicator of the REV < FRAME button lights, the picture moves in the reverse direction.
▶|◀ STILL button: For still picture
1/10 button: For slow motion picture at 1/10 normal speed
1/5 button: For slow motion picture at 1/5 normal speed
× 1 button: For normal speed picture
× 2 button: For double-speed picture
× 9 button: For fast motion picture at 9 times normal speed

[8] **FRAME buttons**
During normal or variable speed playback, these buttons are used to select the direction of playback. Press the > FWD button for forward picture, or the REV < button for reverse picture.
These buttons are also used for frame-by-frame playback. During pause of playback or in still picture mode, press the > FWD button to advance the picture by one frame, or the REV < button to reverse the picture by one frame. If either button is kept depressed, the picture moves frame by frame continuously.

[9] **PROG (programme) +/– buttons**
Press + to advance or – to reverse the programme numbers. Also used for clock setting and timer setting.

[10] **Tuning compartment**
All the switches and buttons for programming stations are in this compartment.



ⓐ **RESET button:** To clear the programmed station, press this button.
ⓑ **AFT button and lamp:** The AFT circuit activates automatically after the stations are tuned and memorized with automatic and manual programming. The AFT lamp will illuminate. If you wish to restore the AFT on the station which has been fine-tuned manually with the FINE buttons, press the AFT button.
ⓒ **FINE + and – buttons:** Press to fine-tune the station.
ⓓ **AUTO PROGRAM (automatic programming) button:** To preset the receivable stations automatically, press this button.
ⓔ **Tuning lamps:** Lights to indicate the tuning band.
ⓕ **SEARCH + and – buttons:** Press to tune in a station. Press the – button to get a station of lower frequency and the + button to get a station of higher frequency.

[11] **INSERT indicators**
The AUDIO indicator lights when the AUDIO INSERT button is pressed, and the VIDEO indicator lights when the VIDEO INSERT button is pressed.

[12] **Function buttons**
◀◀ REW button: Press to rewind the tape.
▶ PLAY button: Press to play the tape back.
▶▶ FF button: Press to advance the tape rapidly.
■ STOP button: Press to stop the tape.
❚❚ PAUSE/▶|◀ STILL button: Press to stop the tape for a moment during recording or playback. Press again to release the pause mode.
● RECORD button: Press to start recording.

[13] **SUPER BETA indicator**
This indicator lights when the SUPER BETA selector is set to the SUPER BETA (STD or PRO) position.

[14] **EDIT indicator**
This indicator lights when the EDIT switch is set to the lower position.

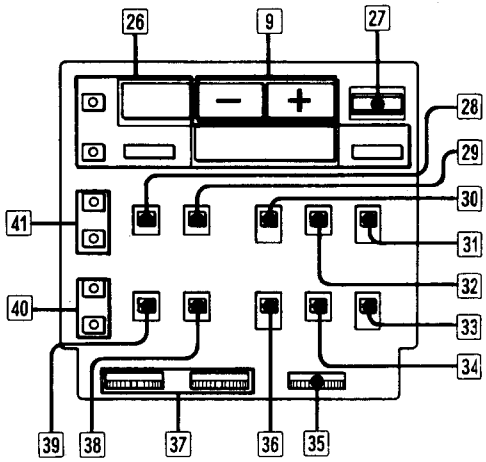
[15] **INDEX button**
This button is used for the index search or index scan operation. See page 23.

[16] **GO TO ZERO button**
In stop mode, press this button to advance or rewind the tape to approximately the "0H00M00S" point on the time counter.

[17] **COUNTER RESET button**
Press to reset the time counter to "0H00M00S".

[18] **TV/VTR select button**
This button is operable when a TV is connected to the recorder's 21-pin EUROCONNECTOR.
To view a TV programme selected by the PROG buttons on the recorder or to monitor the picture being recorded, press this button so that the VTR indicator appears in the display window. When the ▶ PLAY button on the recorder is pressed, the recorder is automatically set in the VTR mode. To view a TV programme in the usual manner, press this button so that the indicator goes off. When the recorder is turned off, the recorder is automatically set in the TV mode.

Inside the front panel



19 REC LEVEL (recording level) controls
Used to adjust the audio recording level of Beta hi-fi recording. Normally set these controls to 5 (green position) for recording TV programmes.

20 PEAK PROG (programme) METER/BETA HI-FI TRACKING meters
When the LEVEL METER selector is set to ON, these meters show the peak input levels of the left and right channels during Beta hi-fi recording, and recorded levels during playback.
When the LEVEL METER selector is set to BETA HI-FI TRACKING, the meters show the audio tracking adjustment. Adjust the audio tracking for optimum sound reproduction of a tape on which only the sound has been recorded in Beta hi-fi.

21 Beta hi-fi lamp
Lights to show Beta hi-fi recording, or playback of a Beta hi-fi recorded tape regardless of the BETA HI-FI selector's position.

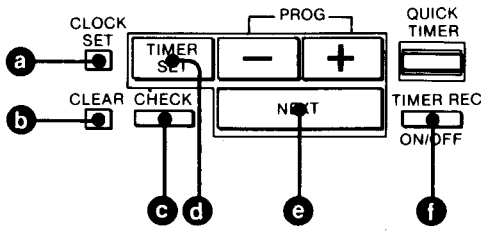
22 SOUND lamp
When the RECORD mode selector is set to SOUND, this lamp lights to show audio recording. It also lights when a tape with audio signals only is being played back.

23 MIC (microphone) jack (minijack)
Connect a microphone to record the sound from it on the conventional audio track.

24 PHONES jack (stereo phone jack)
Connect headphones to monitor the sound.

25 PHONE LEVEL control
Adjust the sound volume of the headphones.

26 Buttons for clock and timer setting



- **a CLOCK SET button:** Press to initiate clock setting.
- **b CLEAR button:** Press to erase the memory of the timer setting.
- **c CHECK button:** Press to check timer settings.
- **d TIMER SET button:** Press to initiate timer setting.
- **e NEXT button:** Press to advance to the next item to be set during clock or timer setting.
- **f TIMER REC ON/OFF button:** Press to activate timer recording. Press it again to deactivate timer recording or quick timer recording in timer standby mode or while recording.

27 QUICK TIMER button
Press to set the recording duration up to 4 hours in units of 30 minutes.

28 TONE selector
Normally set to HIGH. If the high frequencies of the playback sound recorded on the conventional audio track seem exaggerated, set to LOW.

[29] BETA HI-FI selector

Selects the video track or the conventional audio track for sound playback.

AUTO: Normally, set to this position. The recorder will automatically select the video track for Beta hi-fi recorded tapes or the conventional audio track for tapes recorded without the Beta hi-fi system.

NORMAL: Set to this position when you wish to listen to the sound recorded on the conventional audio track of a Beta hi-fi recorded tape.

[30] AUDIO MONITOR selector

When the BETA HI-FI selector is set to AUTO, select the sound to be listened to. See page 18.

When the BETA HI-FI selector is set to NORMAL, the sound being recorded or already recorded on the conventional audio track is heard, regardless of the position of this selector.

[31] LEVEL METER selector

Set to ON to turn on the PEAK PROG METER.

Set to OFF to turn the meter off. Set to BETA HI-FI TRACKING to adjust the audio tracking of a tape on which the sound only has been recorded in Beta hi-fi.

[32] DISPLAY switch

Normally set to ON. To turn off the on-screen display on the TV or monitor, set to OFF.

[33] SUPER BETA selector

Normally keep this selector at NORMAL. To record or play back in Super Beta, set to STD or PRO. See page 16.

[34] EDIT switch

Normally keep this switch at the upper position. When editing a tape onto another recorder, set to the lower position.

[35] SHARPNESS control

Used to adjust the sharpness of the playback picture if necessary. Normally set the control at the center detent position.

[36] INPUT SELECT switch

Select the programme to be recorded.

TUNER: For recording TV programmes

SIMUL: For recording FM simulcast programmes

LINE/PCM: For recording signals connected to the VIDEO IN and AUDIO IN jacks

[37] TRACKING controls

Normally keep these controls at the center detent position. Turning either of the controls may help clear possible streaks or noise bands on the screen. See "Picture adjustment for variable speed playback" on page 20.

The NORMAL control is also used for Beta hi-fi tracking adjustment.

[38] MPX FILTER (multiplex filter) switch

Normally set to ON for Beta hi-fi recording. The multiplex filter cuts off the high-frequency signals which sometimes grate on the ear. If you wish to record without cutting the high frequencies, set to OFF.

[39] RECORD mode selector

VIDEO: Normally, set to this position. Sound and picture are recorded in Beta hi-fi.

SOUND: Set to this position to record sound only in Beta hi-fi.

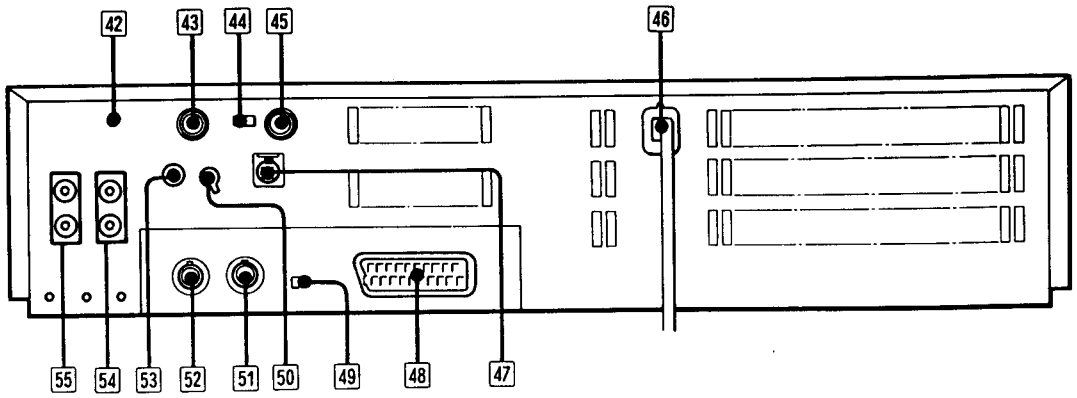
[40] INSERT buttons

Use these buttons to " insert " a new recording onto a part of a recorded tape. Press the AUDIO button to insert sound on the conventional audio track. Press the VIDEO button to insert picture and/or Beta hi-fi sound on the video track.

[41] INDEX buttons

Press the MARK button to mark an index signal at the desired point during recording or playback. To erase a prerecorded index signal, locate the index signal and press the ERASE button.

Rear



42 RF CHANNEL screw
If there is interference on the factory-preset channel for RF output and the signal of this recorder cannot be displayed clearly on the TV screen, adjust this screw with the supplied screwdriver.

43 AERIAL OUT socket
Connect the aerial input of the TV receiver using the supplied cable.

44 DX/LOCAL switch
Normally set this switch to DX. If the TV signal is very strong, set the switch to LOCAL.

45 AERIAL IN socket
Connect the aerial cable.

46 AC mains lead

47 CONTROL L connector (5 pin)
Connect to the CONTROL L connector of other Sony products for various system operations.

48 EUROCONNECTOR (21 pin)
Connect to the 21-pin EUROCONNECTOR of another recorder, TV or video monitor.

49 TEST SIGNAL switch
Set to ON to obtain the test pattern for adjusting the TV so that it can receive the signal from the recorder.

50 STILL ADJ (still picture adjustment) knob
If the still or slow motion picture appears to shake, turn this knob until it stabilizes.

51 VIDEO IN jack (BNC type)
Connect to the video output of a camera, another video cassette recorder, a PCM digital audio processor, etc.

52 VIDEO OUT jack (BNC type)
Connect to the video input of another video cassette recorder, a video monitor or a PCM digital audio processor.

53 CONTROL S input jack (minijack)
Connect to the CONTROL S output jack of other Sony products for various system operations.

54 AUDIO IN jacks (phono type)
Connect to the audio outputs of a camera or another video cassette recorder, or to the recording outputs of a stereo amplifier.

55 AUDIO OUT jacks (phono type)
Connect to the audio inputs of a video monitor or another video cassette recorder, or to the auxiliary inputs or tape inputs of a stereo amplifier.

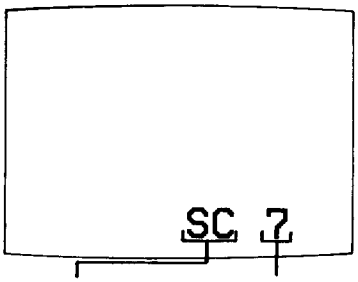
1-4. ON-SCREEN DISPLAY

The various operation modes of this recorder are displayed on the screen of the connected TV or monitor.

Note
The on-screen display does not appear when there is no picture on the screen.

WHEN A TV PROGRAMME IS SELECTED

The programme number is displayed when the INPUT SELECT switch is set to TUNER or SIMUL and the +/– PROG button is pressed.
The programme number will be turned off in several seconds.



Simulcast indicator* Programme number or AU

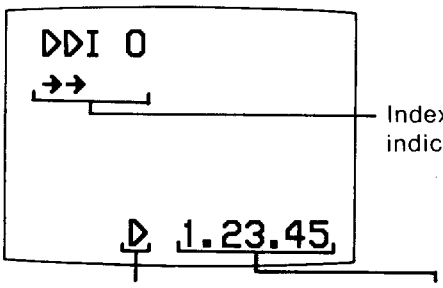
*The SC indicator appears when the INPUT SELECT switch is set to SIMUL.

WHEN THE TAPE IS IN OPERATION

The time counter and the tape operation mode are displayed.

Most of the tape operation mode indicators will be automatically turned off in several seconds.
The time counter normally remains displayed. To turn off the counter, press the COUNTER DISPLAY button on the Remote Commander. To recall the counter display, press the same button again.

Note
Once the on-screen time counter is turned off with the COUNTER DISPLAY button, it will not appear even when the recorder is turned off and on again.

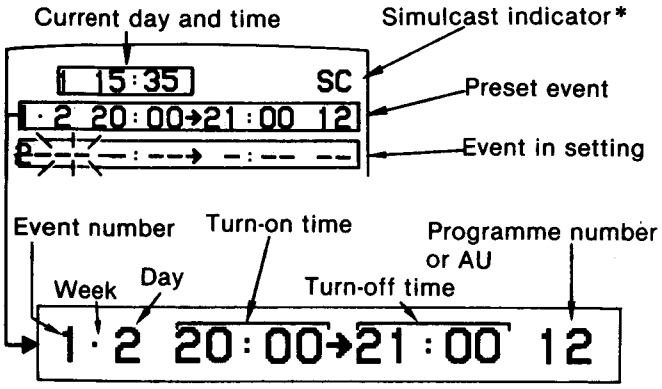


Tape operation mode indicators

◁◁	Rewind	D I◁	Still picture
D	Playback	II D	Forward frame-by-frame picture
DD	Fast-forward	◁II	Reverse frame-by-frame picture
(◁◁)	Reverse picture search	U●	Video insert
(DD)	Forward picture search	U●II	Video insert pause
DII	Playback pause	A●	Audio insert
O	Recording	A●II	Audio insert pause
OII	Recording pause	A/U●	Audio/video insert
X9 –X9	Variable speed playback "–" indicates the reverse direction.	A/U●II	Audio/video insert pause
X2 –X2		–DD I–	Manual index signal mark or erase
X1 –X1		_ DDI _	Index scan
1/ 5 –1/ 5			
1/10 –1/10		DD I	Index search

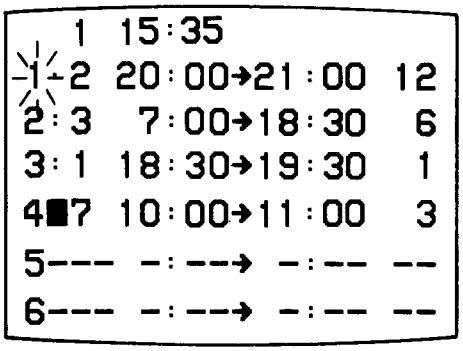
DISPLAY FOR TIMER

When the TIMER SET button is pressed, the preset events and the event in setting are displayed. The blinking item is what you are setting.

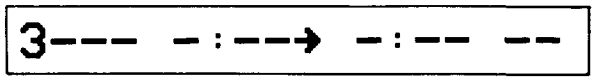


Week indicators		Day indicators	
1→7	Every day	1	Monday
·	This week	2	Tuesday
:	Next week	3	Wednesday
⋮	The week after next	4	Thursday
■	Every week	5	Friday
		6	Saturday
		7	Sunday

When the CHECK button or the TIMER DISPLAY button on the Remote Commander is pressed, the list of all preset events appears.
Every time the CHECK button is pressed, the event number blinks in sequence to show that the setting of that particular event can be changed or cleared.



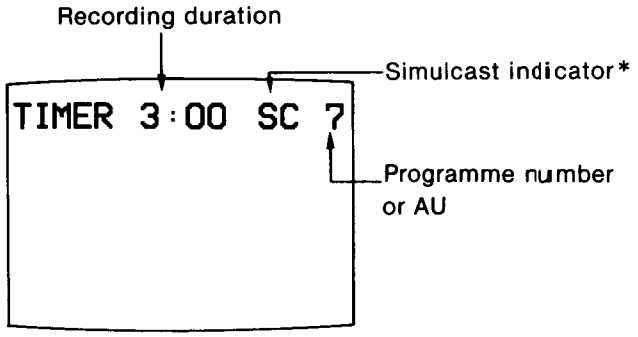
When the CLEAR button is pressed, the event will be erased from the memory.



The timer display will be turned off when the TIMER DISPLAY button is pressed again or when the CHECK button is pressed with the last event number blinking.

WHEN THE QUICK TIMER IS ACTIVATED

The recording duration and the programme number are displayed. The display will be automatically turned off in several seconds.

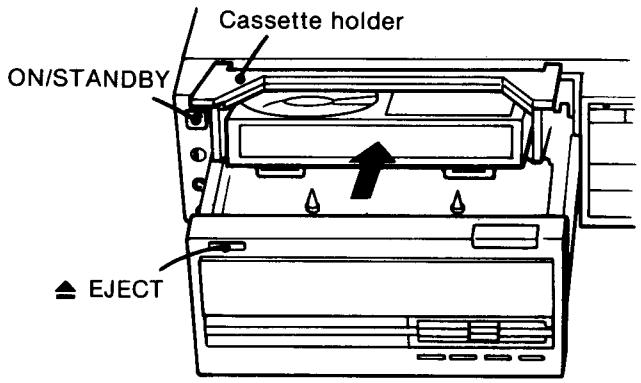


*The SC indicator appears when the INPUT SELECT switch is set to SIMUL.

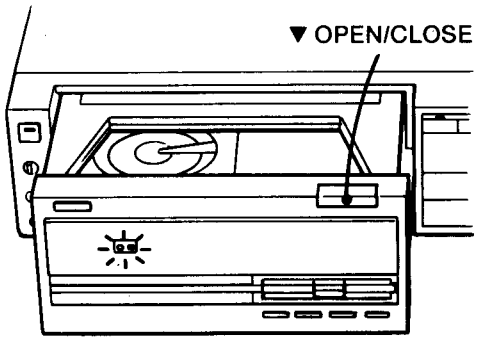
BASIC OPERATIONS

1-5. CASSETTE INSERTION

1 Press the ON/STANDBY switch. The indicator on the switch and the Beta hi-fi lamp will light.
2 Press the ⏏ EJECT button. The cassette compartment slides out and the cassette holder is raised.
3 Insert a cassette with the arrow on the cassette towards the front.



4 Press the ▼ OPEN/CLOSE button. The cassette compartment slides in and the ⊡ indication appears in the display window.



In place of Step 4, you may press any of the function buttons. The cassette compartment slides in and the recorder directly goes into the selected tape operation mode.

To eject the cassette
Press the ⏏ EJECT button. The cassette compartment slides out and the cassette holder is raised. Take out the cassette by hand.

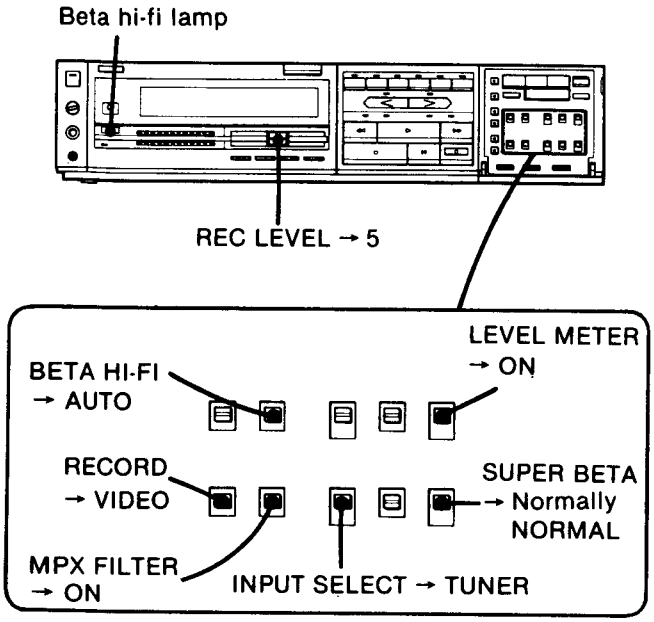
Note
The ⏏ EJECT button does not function when the recorder is turned off or during recording or audio/video inserting.

To open/close the cassette compartment
By pressing the ▼ OPEN/CLOSE button, the cassette compartment can be slid out or in even while the tape is running, allowing check of the remaining tape amount.

Notes on the cassette compartment
- Be careful not to trap your hand between the cassette compartment and the cabinet when the compartment is moving. If you should do so, the cassette compartment will automatically stop and move in the opposite direction in several seconds.
- Do not insert anything other than a cassette inside the cassette holder and compartment.
- Do not push down on the cassette holder forcibly when it is raised. If excessive force is applied, the protective device is activated to stop the cassette compartment movement and recorder operation. In this case, press the ▼ OPEN/CLOSE button.
- Frequent moving of the cassette compartment during recording is not recommended, since this may affect the recording.

1-6. TV PROGRAMME RECORDING (Beta hi-fi recording)

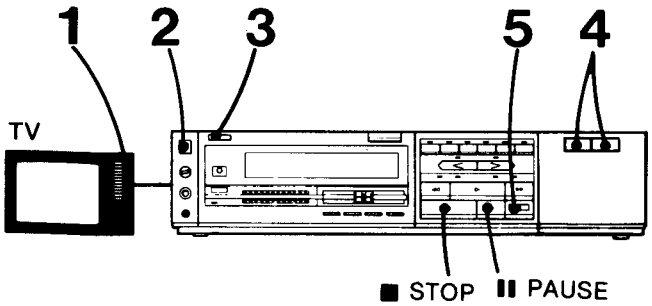
Check before recording
The green position is the standard setting position for Beta hi-fi recording.



Recording will be made both on the video track (Beta hi-fi recording) and on the conventional audio track.

TO RECORD

Numbers in the illustration show the sequence of operation.



1 Turn on the TV and select the programme position for the recorder.
2 Press the ON/STANDBY switch. The indicator on the switch and the Beta hi-fi lamp will light up.
3 Insert the cassette. See page 15.
4 Select the programme to be recorded with the +/– PROG buttons.
5 Press the ● RECORD button. The indicator on the button will light and recording will begin.
- If the inserted cassette does not have the safety tab, the cassette will be automatically ejected.

To stop recording momentarily, press the II PAUSE button. The indicator on the button will light. The TV programme can be seen on the TV, but the picture will not be recorded.
To resume recording, press the II PAUSE button again.
To protect the video heads and the tape, the pause mode will be automatically released after about 8 minutes and recording will stop.

To stop recording, press the ■ STOP button.

To eject the cassette, press the ⏏ EJECT button after stopping the recording.

To view another TV programme while recording, simply select the programme you want to view with the TV's programme selector.

When the tape reaches the end during recording, it will be automatically rewound.

CAUTION
Television programmes, films, video tapes and other materials may be copyrighted.
Unauthorized recording of such material may be contrary to the provision of the copyright laws.

SUPER BETA selector
NORMAL position: Normally keep the selector in this position. When playing back tapes recorded on other non-Super Beta recorders or tapes recorded on this recorder by setting this selector to the NORMAL position, set the selector in this position.
SUPER BETA STD (standard) position: In this position, high quality recording and playback picture are obtained.
SUPER BETA PRO position: If you use the highest-grade tape such as Sony PRO-X or equivalent tapes from other tape manufacturers, further enhanced picture quality is attained. With lower-grade tapes, however, the picture quality will suffer somewhat.
When the SUPER BETA selector is set to the SUPER BETA STD or PRO position, the SUPER BETA indicator lights.

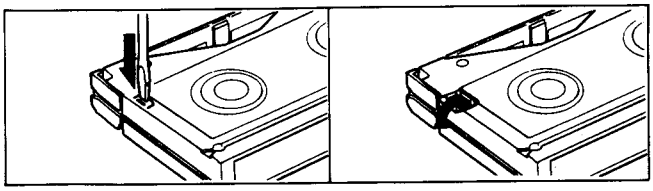
Note
The picture quality will suffer somewhat, if a tape recorded in the SUPER BETA PRO or STD position is played back on other non-Super Beta recorders, or on this recorder with this selector set to NORMAL.

TO KEEP A RECORDED PROGRAMME FROM BEING ACCIDENTALLY ERASED

When a new recording is made on a previously recorded cassette, the previous recording will be automatically erased.

To avoid erasing a recording
Break off the safety tab using a screwdriver or similar object.

To re-record on a cassette which has had the safety tab removed
Cover the slot with a piece of plastic tape.



If you activate the ● RECORD, TIMER REC ON/OFF, VIDEO INSERT or AUDIO INSERT button with a cassette with its safety tab removed inserted, the cassette will be automatically ejected.

RECORDING A STEREO OR BILINGUAL TV PROGRAMME (SL-HF950ES only)

When the ⊙⊙ STEREO indication appears in the display window, a stereo programme is being received. The recording procedure is the same as in " TV programme recording ". The sound is recorded both on the video track (stereo) and on the conventional audio track (monaural).

Conventional audio track	Monaural recording
Video track	Stereo recording

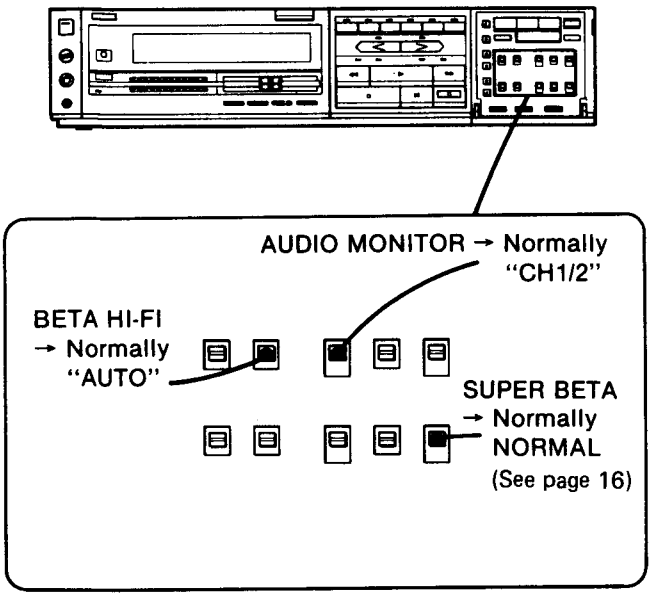
When the ⊙⊙BILINGUAL indication appears in the display window, a bilingual programme is being received. The recording procedure is the same as in "TV programme recording".
Both the local language (usually broadcast on channel 1) and the original language (usually broadcast on channel 2) are recorded on the video track, and only the language on channel 1 is recorded on the conventional audio track.

Conventional audio track	Language on channel 1
Video track	Languages on channels 1 and 2

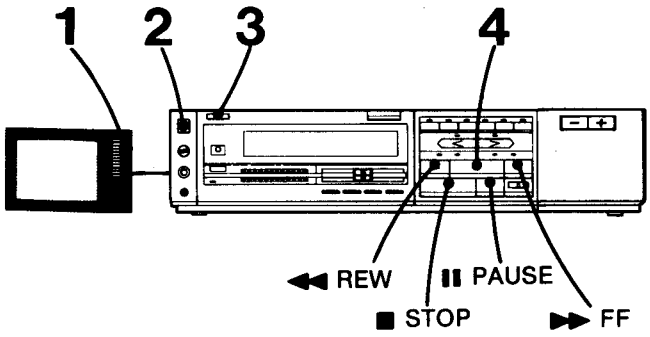
The sound of a stereo or bilingual programme can be monitored by selecting the desired sound with the AUDIO MONITOR selector. See page 18.

1-7. PLAYBACK

Check before playback



Numbers in the illustration show the sequence of operation.



1 Turn on the TV and select the programme position for the recorder.
2 Press the ON/STANDBY switch. The indicator on the switch and the Beta hi-fi lamp will light up.
3 Insert the cassette. See page 15.
4 Press the ▶ PLAY button. The indicator on the button will light and playback will begin.

To stop playback, press the ■ STOP button.

To rewind the tape, press the ◀◀ REW button.

To advance the tape rapidly, press the ▶▶ FF button.

To eject the cassette, press the ⏏ EJECT button.

When the tape reaches the end during playback, it will be automatically rewound.

To stop playback momentarily, press the ❚❚ PAUSE button. A still picture will be seen on the TV screen. To resume playback, press the ❚❚ PAUSE button again or press the ▶ PLAY button.
The pause mode will be automatically released after about 8 minutes and the playback will resume.

SELECTION OF PLAYBACK/RECORDING MONITOR SOUND

For Beta hi-fi recorded tapes
Normally set the BETA HI-FI selector to AUTO. The sound on the video track will be heard. To listen to the sound on the conventional audio track, set the selector to NORMAL.
Return the selector to AUTO after playing back the tape.

During normal playback, the Beta hi-fi lamp lights to show that the tape is Beta hi-fi recorded. Therefore, the lamp also lights when the sound on the conventional audio track of a Beta hi-fi recorded tape is being played back.

For Beta hi-fi recorded stereo or bilingual tapes
Set the BETA HI-FI selector to AUTO and select the sound to be listened to through the speakers or headphones with the AUDIO MONITOR selector. Set to CH1/2 to listen to the stereo sound or both languages. If you want to listen only to the left or right channel of stereo programmes or either language of bilingual programmes, set to CH1 or CH2, referring to the following table.

AUDIO MONITOR selector	Sound to be listened to through :	
	Left speaker	Right speaker
CH1/2	Left channel (Language on channel 1)	Right channel (Language on channel 2)
CH1	Left channel (Language on channel 1)	
CH2	Right channel (Language on channel 2)	

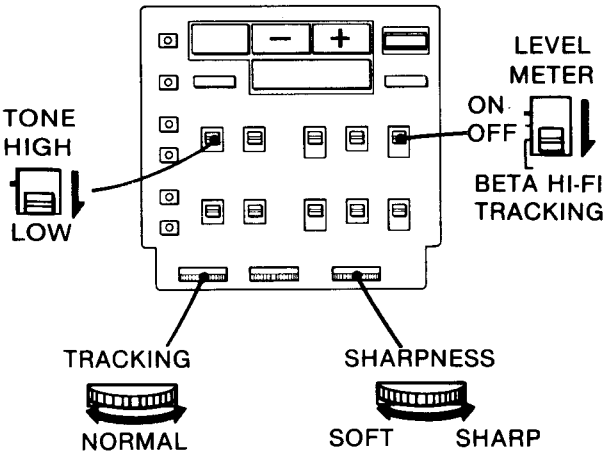
( ) for bilingual programmes

Note
If this recorder is connected to a monaural TV or it is connected to the aerial input of a TV, the sound will be always heard in monaural.

For non-Beta hi-fi recorded tapes
A tape recorded on another recorder without Beta hi-fi system is played back in the conventional way, regardless of the position of the BETA HI-FI and AUDIO MONITOR selectors.

PICTURE AND SOUND ADJUSTMENT

- To adjust the sharpness of the playback picture, turn the SHARPNESS control.
- If streaks or snow appear during playback of a tape recorded on another recorder, adjust the NORMAL TRACKING control for the best possible picture. Return the control to the centre position after playing back that particular tape.
- If the sound of a tape recorded on another Beta hi-fi recorder is noisy or cannot be heard, adjust the NORMAL TRACKING control.
- If the high frequencies of the playback sound recorded on the conventional audio track seem exaggerated, set the TONE selector to LOW. Return it to HIGH after playing back that particular tape.
- When playing back a tape with only the sound recorded in Beta hi-fi (that is, a tape recorded with the RECORD mode selector set to SOUND), set the LEVEL METER selector to BETA HI-FI TRACKING and adjust the NORMAL TRACKING control so that the meters deflect to the right as far as possible.



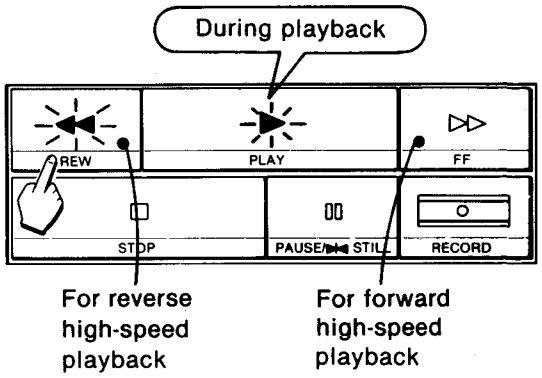
Note
The BETA HI-FI TRACKING meters function properly only when a tape recorded with the RECORD mode selector set to SOUND is being played back. For tapes recorded with the selector in the VIDEO position, the meters do not deflect at all or deflect minimally.

VARIOUS PLAYBACK MODES

PICTURE SEARCH

—Viewing the picture at high speed to find a particular scene

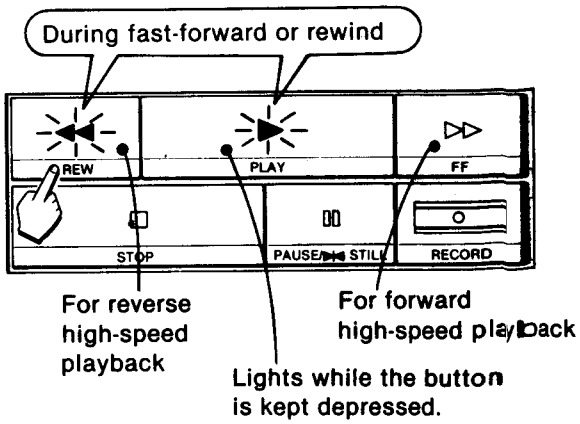
During playback, keep the ◀◀ REW or ▶▶ FF button pressed to reverse or advance the picture at high speed. Release the button at the desired point. Normal playback will resume. The picture search mode can also be assured directly from the pause mode.

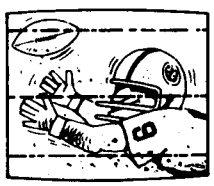


SKIP SCAN

—Viewing the picture momentarily in the fast-forward or rewind mode

During rewind or fast-forward mode, keep the ◀◀ REW button pressed for high-speed picture reverse, or keep the ▶▶ FF button pressed for high-speed picture advance. The picture appears momentarily while either of the buttons is pressed. Release the button at the desired point. Normal rewind or fast forward mode will resume.



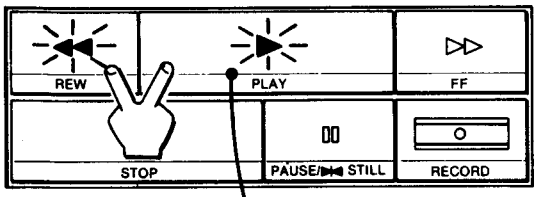


Streaks will appear during the picture search and the skip scan modes.

AUTO PLAY

—To rewind the tape and automatically play it back

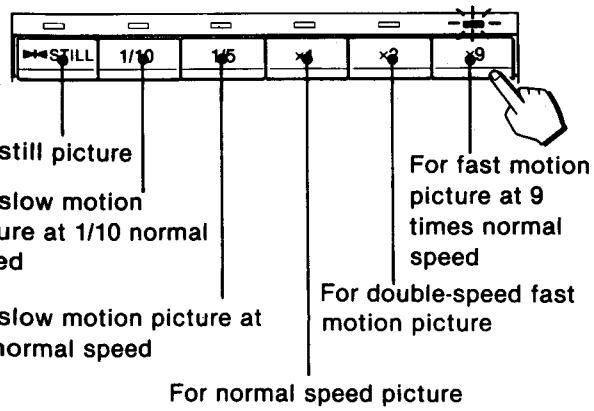
Press the ▶ PLAY button and ◀◀ REW button simultaneously in stop mode. After the tape is rewound to the beginning, it will be automatically played back.



Blinks while rewinding

VARIABLE SPEED PLAYBACK

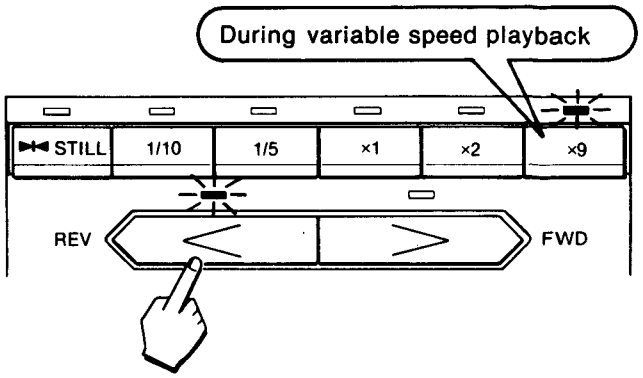
During playback or pause of playback, press one of the variable speed playback buttons. The indicator on the button lights.
The sound will be muted during variable speed playback.



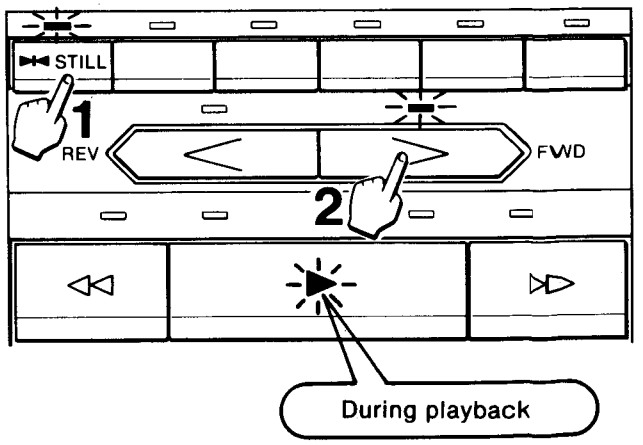
To resume normal playback, press the ▶ PLAY button.

To change the playback speed, simply press the desired variable speed playback button.

To reverse the direction of the variable speed playback, press the REV < button. The indicator on the button lights. To resume forward playback, press the > FWD button.



Frame-by-frame playback
Play back the tape and press the ❚❚ PAUSE/▶◀ STILL button or the ▶◀ STILL button. Then press the > FWD or REV < button momentarily. Each time the button is pressed, the picture advances or reverses by one frame. If the > FWD or REV < button is kept depressed, the picture advances or reverses frame by frame continuously.



Picture adjustment for variable speed playback

- If the still picture appears to shake, turn the STILL ADJ knob on the rear panel until the picture stabilizes. As long as the same TV is used with this recorder, this adjustment should not be needed so frequently.
- If streaks or noise bands appear in still picture or slow motion (1/5 or 1/10) forward picture or in frame-by-frame playback, adjust the SLOW TRACKING control.
- If streaks or noise bands appear in normal (×1) or double speed (×2) forward picture, adjust the NORMAL TRACKING control.

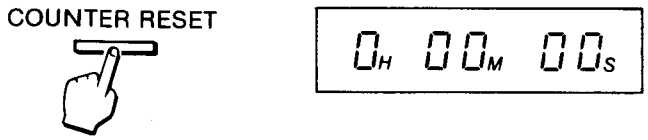
Note
The Beta hi-fi lamp and the SOUND lamp do not light during variable speed playback.

1-8. USE OF THE TIME COUNTER

The time counter indicates the approximate running time of the tape and the relative position of programmes on the tape.

TO INDEX THE TAPE CONTENTS

Before starting recording or playback, press the COUNTER RESET button to set the counter to "0H00M00S". By noting the counter reading at the desired point, you can easily find that point later by referring to the counter. Use the label on the cassette to list the programmes and their counter readings.



Notes

- The counter reading is automatically reset to zero when a cassette is newly inserted.
- The counter reading will be retained in the memory even after the power is turned off, as long as the cassette is in the cassette compartment.
- The counter will not advance during any portion of a tape that is blank or unrecorded. So the counter can be used to find unrecorded sections on a tape.

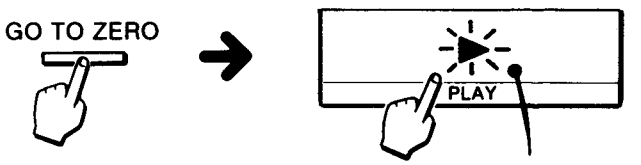
"GO TO ZERO" FUNCTION

—To stop the tape at a particular point or play back from a particular point

1 During recording or playback, press the COUNTER RESET button at the point you later want to locate.
2 When recording or playback is finished, stop the tape and press the GO TO ZERO button.
The tape will be rewound or advance close to the point where the counter reads "0H00M00S".
During rewinding or fast-forward mode, the indicator on the ◀◀ REW or ▶▶ FF button lights, depending on the tape movement direction.

To start playback automatically from the "0H00M00S" point

Press the ▶ PLAY button after pressing the GO TO ZERO button.



Blinks during rewind or fast-forward mode.

Note

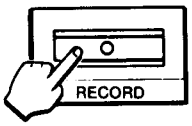
The "go to zero" function cannot be activated when the counter reading is within ± 0H00M10S.

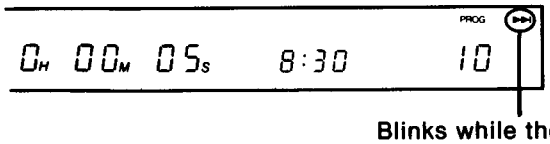
1-9. INDEX FUNCTION

The desired programme can be easily located by the index signal marked on the tape.

TO MARK INDEX SIGNALS

An index signal is automatically marked on the tape when the ● RECORD button is pressed or when a timer recording starts.





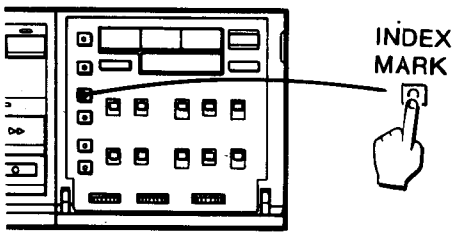
Blinks while the index signal is being marked.

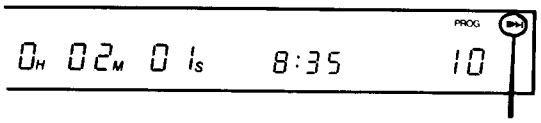
Notes

- Index signals will not be marked on the tape when the recording is started by releasing the recording pause mode.
- The index function operates also with the index signals marked using the index function of other recorders.

Index signals can be marked at any desired point on the tape during recording, timer recording or normal playback.

At the point where an index signal is to be marked, press the INDEX MARK button.





Blinks while the index signal is being marked.

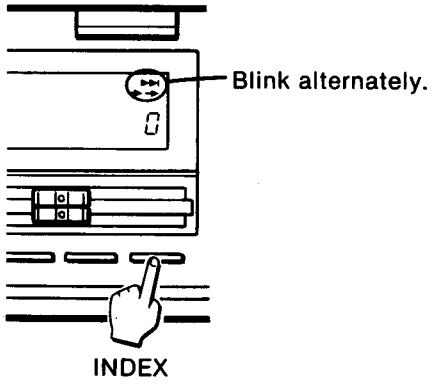
Notes

- During playback, the sound recorded on the tape will be muted while the index signal is being marked, but the recording will not be affected.
- Index signals can be marked on cassette tapes without a safety tab (including commercially available prerecorded video tapes).

INDEX SCAN

—To play back the beginning of each programme in sequence

1 Insert a cassette that has index signals marked.
2 Press the INDEX button once. The ▶▶| and →→ indicators will blink alternately, and the index number 0 is displayed.

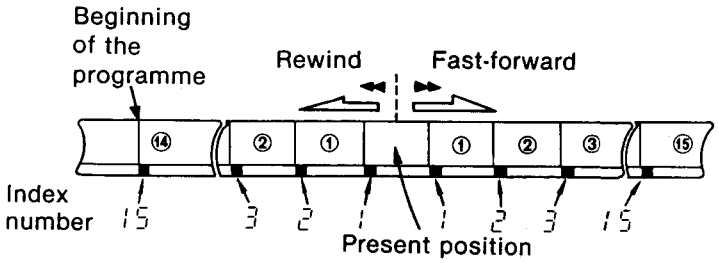


3 To scan the previous programmes, press the ◀◀ REW button.
To scan the programmes ahead, press the ▶▶ FF button.
The ▶▶| and →→ indicators will blink simultaneously and the tape will be rewound or rapidly advanced to the next index signal marked.
Whenever an index signal is detected, the tape will be played back for approximately 10 seconds, and then rewound or rapidly advanced to the next index signal.
Every time an index signal is detected and playback begins, the displayed index number increases.
4 At the desired programme, press the the ▶ PLAY button. Normal playback of that programme will begin.

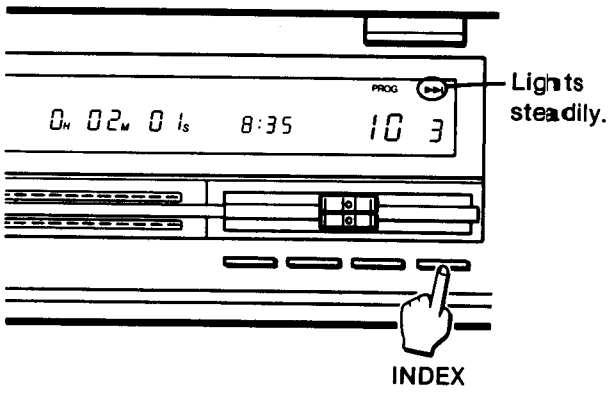
INDEX SEARCH

—To locate the desired programme

You can locate the desired programme and play it back automatically by designating the number of its index signal. Up to the 15th index signal from the present position on the tape can be located.



1 Insert a cassette that has index signals marked.
2 Press the INDEX button several times until the index number of the desired programme is displayed.
For instance, to locate the second programme ahead, two index signals should be detected, so press the INDEX button until " 2 " is displayed. On the other hand, to locate the second programme behind, three signals should be detected, so press the button until " 3 " is displayed.



- If you enter an incorrect index number, press the ■ STOP button to reset the display.

3 To locate a previous programme on the tape, press the ◀◀ REW button.
To locate a programme ahead, press the ▶▶ FF button.

The tape will be rewound or rapidly advanced. Every time an index signal is detected, the displayed index number will decrease. When the number reaches 0, play back of your desired programme will begin.

Notes

- The index function can be activated during playback, as well as from stop mode.
- While the index signals are being scanned or located, there will be no picture or sound.
- If the tape is rewound to the beginning during index scan or index search, playback will begin automatically.
- If the tape reaches the end during index scan or index search, the tape will be rewound automatically.

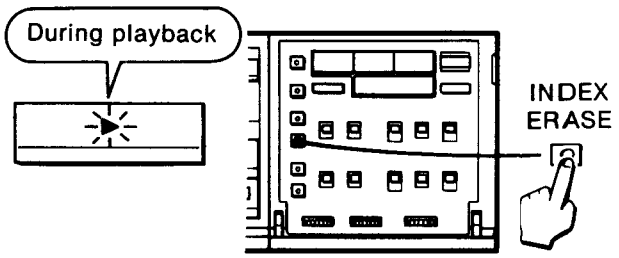
When the desired programme cannot be played back with the index function, check the following:

- The nearest index signal may not have been counted. If the point where you pressed the ◀◀ REW or ▶▶ FF button is fairly close (within 2 minutes of the normal tape-run) to the nearest index signal, that signal will not be counted. In such a case, designate one number less than the actual number.
- Is there a space of more than 2 minutes between two index signals? If there is more than one index signal marked within an interval of 2 minutes of the normal tape-run, the mechanism may not function properly.

TO ERASE INDEX SIGNALS

Erasing while index scanning—To erase the index signals in sequence

1 Stop the tape with the ■ STOP button.
2 Press the INDEX button once.
3 To erase the previous index signals on the tape, press the ◀◀ REW button. To erase the index signals ahead, press the ▶▶ FF button.
The tape will be rewound or rapidly advanced to the next index signal and playback will begin.
4 **With the tape played back** for approx. 10 seconds, press the INDEX ERASE button. The → indicator will stop blinking while the ▶▶| indicator continues blinking and the index signal will be erased.



After the erasure, index scan will resume. At each index signal located, press the INDEX ERASE button to erase the signal.
To stop index scanning, press the ■ STOP button.

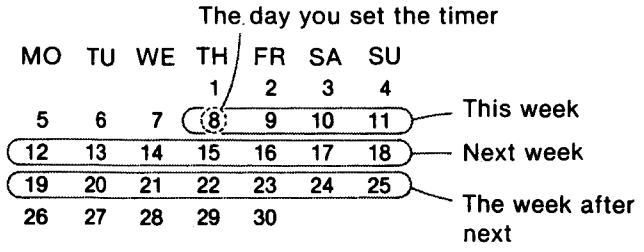
Erasing while index searching—To erase a particular index signal

1 Stop the tape with the ■ STOP button.
2 Press the INDEX button several times until the number of the index signal to be erased is displayed.
3 To locate and erase the previous index signal, press the ◀◀ REW button. To locate and erase the index signal ahead, press the ▶▶ FF button.
4 **With the tape played back** for approx. 10 seconds, press the INDEX ERASE button. The ▶▶| indicator will blink and the index signal will be erased.

After the erasure, normal playback will begin.

1-10. TIMER-ACTIVATED RECORDING

Using the built-in timer, you can make six recordings on any day or every day, this week, next week or the week after next, or on the same day every week.


The day you set the timer
MO TU WE TH FR SA SU
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30
This week
Next week
The week after next

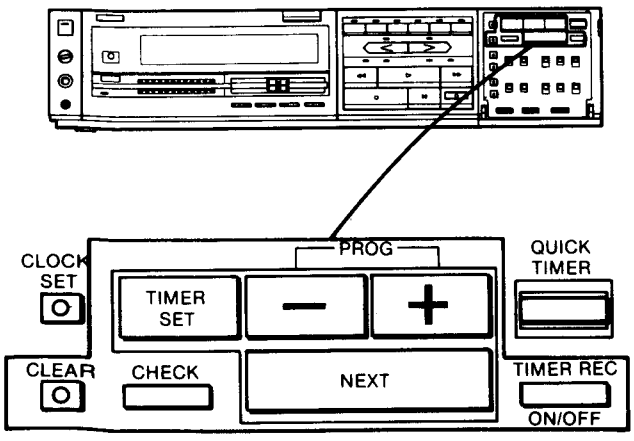
Check before setting the timer

- Is the clock set to the correct day and correct time? Timer setting can only be made after the clock has been set.
- Is a cassette inserted in the recorder?
- Is the cassette long enough to record the programmes?
- Does the cassette have a safety tab on the bottom?
- Is the INPUT SELECT switch set to TUNER for recording TV programmes?

Note: The timer cannot be set during playback.

TO SET THE TIMER

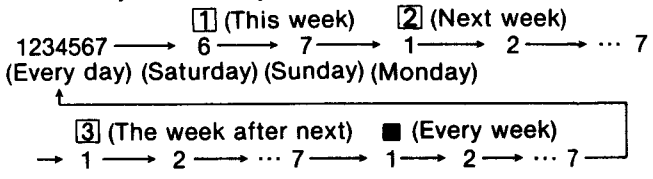
Example: To record a PROGRAM 2 broadcast from 9:00 AM to 11:25 AM on Saturday next week.



NEXT button
Every time you press the NEXT button, the item to be preset will blink and you will be setting the item.

PROG +/– buttons
To set the day of the week, the time and the programme number, press the + button to advance, and the – button to go back.

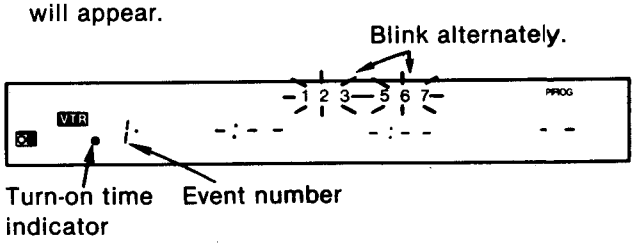
Week and day indicators
By pressing the + PROG button, the week and day indicators change as follows:
Ex. Today is Saturday.



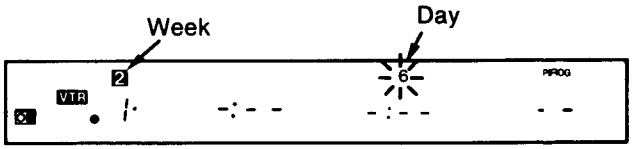
To record at the same time every day, select "1234567". To record at the same time and day every week, select the desired day indicator together with "■ (every week)" indicator.

Setting procedure

1 Press the TIMER SET button. (If the recorder is off, it will be turned on automatically.) An empty event number for which no timer setting has been made will appear.

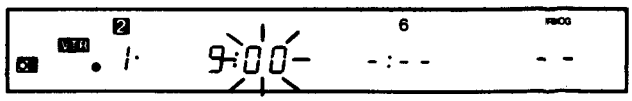


2 Set the week and day by pressing the + or – PROG button.

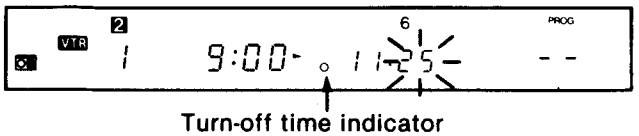


3 Press the NEXT button and set the turn-on hour by pressing the + or – PROG button.

4 Press the NEXT button and set the minute by pressing the + or – PROG button.

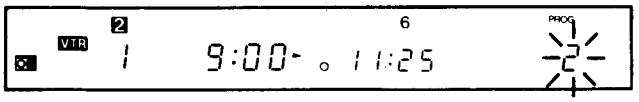


5 Press the NEXT button and set the turn-off hour and minute as in turn-on time setting.



Turn-off time indicator

6 Press the NEXT button and select the programme to be recorded with the + or – PROG button.
To record the signals from the equipment connected to the VIDEO IN and AUDIO IN jacks, set the INPUT SELECT switch to LINE/PCM so that "AU" indication appears.

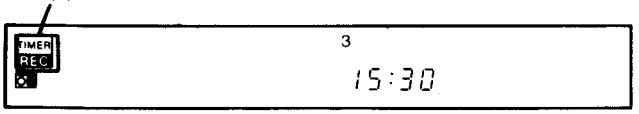


7 Press the NEXT button.
The display reverts to the time counter and the current time.

To set more events, press the TIMER SET button again to display the next event number. Repeat steps 2 to 7 above.

8 Press the TIMER REC ON/OFF button. The TIMER REC indicator appears and the recorder is turned off.

Appears.



At the preset turn-on time, recording will start automatically and will stop at the preset turn-off time.

Note
If the inserted cassette does not have the safety tab, the cassette will be automatically ejected when the TIMER REC ON/OFF button is pressed.

ONCE THE TIMER REC INDICATOR HAS BEEN DISPLAYED, NO FUNCTION OF THE RECORDER CAN BE ACTIVATED, except for checking the timer setting.
To operate the recorder after setting the timer for recording, press the TIMER REC ON/OFF button so that the TIMER REC indicator goes off. To reactivate the timer recording standby mode, be sure to press the TIMER REC ON/OFF button again.

WHILE SETTING THE TIMER

To change the preset item
Press the CLEAR button and repeat the timer setting procedure from Step 1.

To record to the end of the tape
Set the turn-off time to a time after the tape will reach its end.

BEFORE OR DURING TIMER RECORDING

To check the timer settings
Press the CHECK button. Each time the CHECK button is pressed, the preset events are displayed in sequence.

To change the settings
1 Press the TIMER REC ON/OFF button if the TIMER REC indicator is diplayed.
2 Press the CHECK button sufficient times to display the event to be changed in the display window.
3 Press the TIMER SET button.
4 Press the NEXT button sufficient times until the item to be changed blinks.
5 Change the setting with the + or – PROG button.
6 Press the NEXT button until the time counter and the current time appear.
7 Press the TIMER REC ON/OFF button again to reactivate the timer.

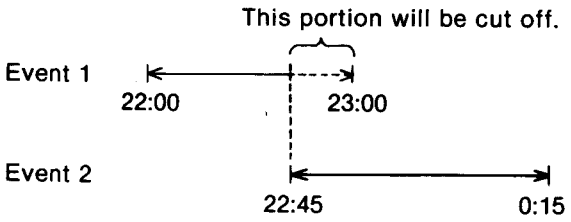
To erase the timer setting of an event
1 Press the TIMER REC ON/OFF button if the TIMER REC indicator is displayed.
2 Press the CHECK button sufficient times to display the event to be erased.
3 Press the CLEAR button.
The event will be erased from the memory.
4 If other events have been preset for recording, press the TIMER REC ON/OFF button again to reactivate.

Note: When the TIMER REC indicator is displayed, the timer setting cannot be erased.

If the tape reaches the end during timer recording
The recording will stop and the tape will be rewound to the beginning. Then after about a second, the recorder will be turned off.

To stop the on-going timer recording
Press the TIMER REC ON/OFF button so that the TIMER REC indicator goes off. The unit will be turned off automatically after about a second.

When two timer settings overlap
If two timer settings are preset as in the following example, the recording of the event 2 will begin before the first recording is completely finished. Consequently, the event 1 will be cut off in the middle of its recording.



AFTER TIMER RECORDING

When a timer recording is finished, the setting (except the everyday or every week setting) will be eliminated and the next timer settings will move up one event position each. For example, if you have preset 4 events, when the first timer recording is finished, the fourth event position will be vacant. If the TIMER SET button is pressed. "4" will appear in the window.

When a power interruption occurs

If the clock shows "0 : 00" blinking, the power has been interrupted for more than 30 minutes (when the built-in battery has been charged at least 48 hours) and all the timer settings will have been erased. Reset the clock and the timer settings.

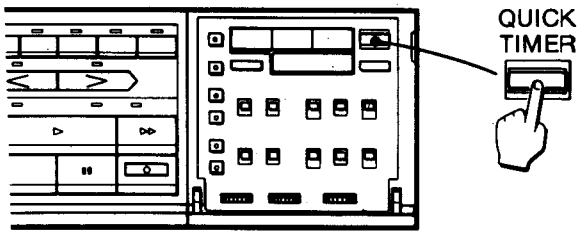
If the power has been interrupted for less than 30 minutes, the timer settings are retained in the memory and the on-going timer recording will resume when the power is resupplied.

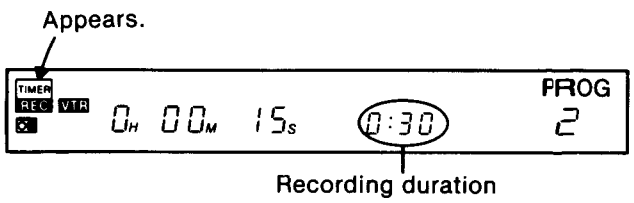
QUICK TIMER RECORDING

—To set the recording duration and to turn off the unit automatically

During recording, you can set the recording duration for up to 4 hours in units of 30 minutes by pressing the QUICK TIMER button. After the preset timer has elapsed, recording stops and recorder is turned off automatically.

1 Start recording.
2 Press the QUICK TIMER button to set the recording duration.
The TIMER REC indicator will appear.





Each time you press the QUICK TIMER button, the indication changes :
0 : 30 → 1 : 00 → 1 : 30 → 2 : 00 → ... 3 : 30 → 4 : 00

As the recording continues, the duration indication decreases minute by minute to 0 : 00 and the recording stops. The recorder is turned off automatically.

To extend the recording duration
The on-going recording duration can be extended simply by pressing the QUICK TIMER button.
The duration will be extended in units of 30 minutes with each pressing.
Example: When 2 : 25 is indicated,
2 : 25 → 2 : 30 → 3 : 00

To cancel the quick timer function
Press the TIMER REC ON/OFF button so that the TIMER REC indicator goes off. The recorder will be turned off automatically after about a second.

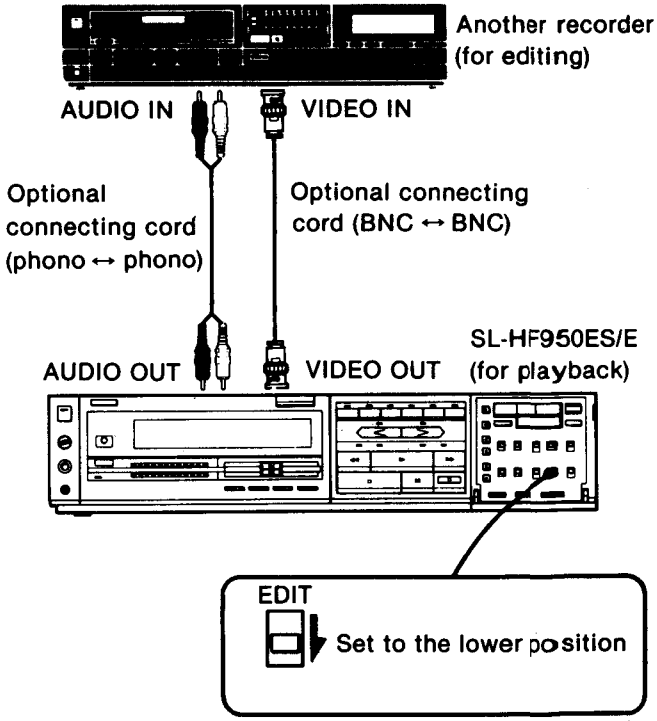
To stop quick timer recording momentarily
Press the ▮▮ PAUSE button. To resume recording, press the same button again.

Note
During quick timer recording, only the QUICK TIMER, ▮▮ PAUSE and TIMER REC ON/OFF buttons can be activated. To activate the other buttons, press the TIMER REC ON/OFF button so that the TIMER REC indicator goes off.

1-11. TAPE EDITING

To edit a tape, you will need two video recorders: one is to play back the original tape and the other is to record. To make the most of this unit's excellent editing performance, using this unit for playback is recommended.

CONNECTIONS



OPERATION

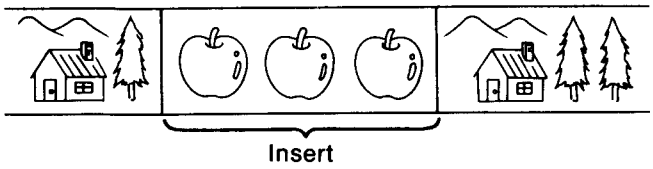
Set the INPUT SELECT switch of the recorder for editing to LINE (line input), if provided.
Set the recorder for playback to playback mode, and the recorder for editing to record mode.

EDIT switch
Generally, a recorder electrically rectifies the original signals recorded on a tape for optimum viewing on a TV or monitor. However, this rectification is not needed and even result in over-rectification, when the signal is being recorded onto a tape in another recorder. When the EDIT switch is set to the lower position, the rectification circuit is cancelled. This allows direct recording of the original signal onto the tape in another recorder.

CAUTION
Television programmes, films, video tapes and other materials may be copyrighted. Unauthorized duplication of such material may be contrary to the provision of the copyright laws.

AUDIO AND VIDEO INSERT

By using the INSERT buttons, you can easily "insert" (re-record) new sound or picture onto a pre-recorded tape.



Audio insert—Inserting new sound (monaural) on the conventional audio track without erasing the original picture and Beta hi-fi sound on the video track

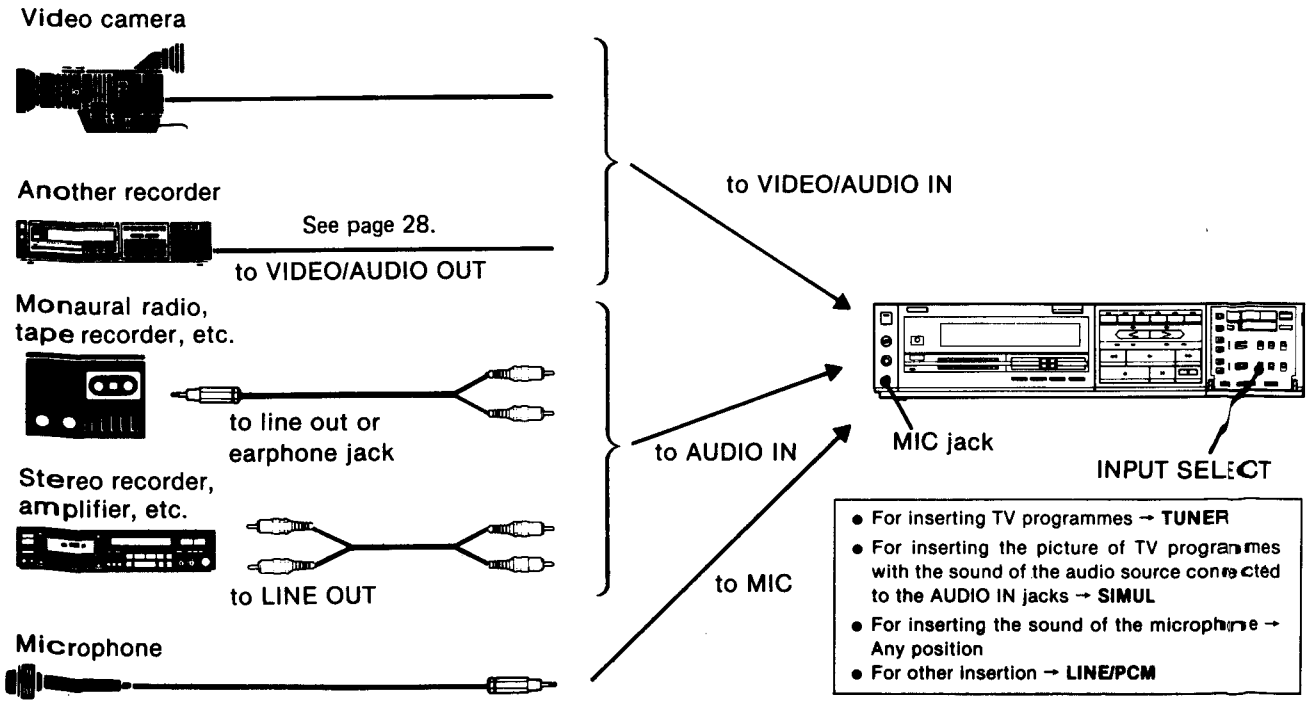
Video insert—Inserting new picture and/or Beta hi-fi sound without erasing the original sound on the conventional audio track

Audio and video insert—Inserting new sound and picture onto both the video and conventional audio tracks

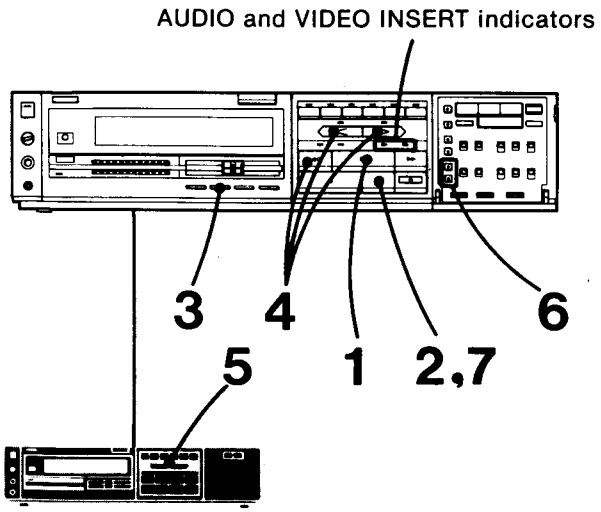
The recording after audio, video or audio/video insertion

Audio insert	Conventional audio track Newly inserted monaural sound Video track
Video insert	Newly inserted picture and/or Beta hi-fi sound
Audio and video insert	Newly inserted monaural sound Newly inserted picture and/or Beta hi-fi sound

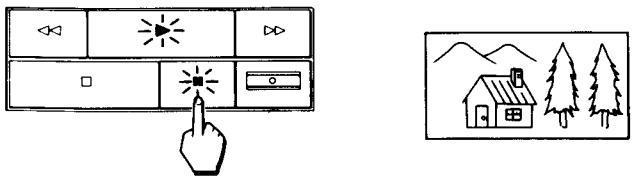
AUDIO AND VIDEO SOURCE CONNECTION


Video camera
Another recorder
See page 28.
to VIDEO/AUDIO OUT
Monaural radio, tape recorder, etc.
to line out or earphone jack
Stereo recorder, amplifier, etc.
to LINE OUT
Microphone
to VIDEO/AUDIO IN
to AUDIO IN
to MIC
MIC jack
INPUT SELECT
• For inserting TV programmes → TUNER
• For inserting the picture of TV programmes with the sound of the audio source connected to the AUDIO IN jacks → SIMUL
• For inserting the sound of the microphone → Any position
• For other insertion → LINE/PCM

OPERATION

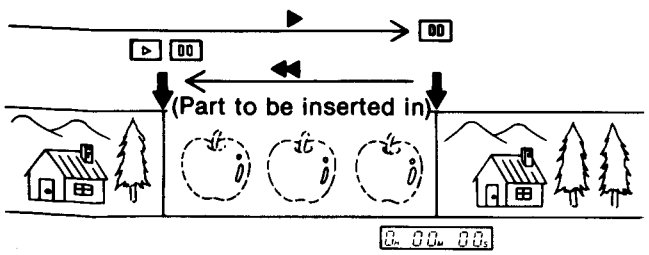


1 Play back the original tape on which you want to make insertion.
2 At the point where you want to stop the insertion, press the ▮▮ PAUSE button.



If necessary, press the > FWD or REV < button to locate the point accurately, then press the ▮▮ PAUSE button.

3 Press the COUNTER RESET button.
The time counter will be reset to "0H00M00S".
4 Using the ◀◀ REW button and the > FWD and REV < buttons, locate the point where you want to start the insertion, and set the recorder to playback pause mode.



5 Play the audio and/or video source.
6 For "Audio insert", press the AUDIO INSERT button.
For "Video insert", press the VIDEO INSERT button.
For "Audio and video insert", press the AUDIO and VIDEO INSERT buttons.
The corresponding AUDIO and/or VIDEO INSERT indicators will light.

7 Press the ▮▮ PAUSE button. The audio and/or video insert will start.

At the "0H00M00S" point on the counter, the insertion will stop.

To stop insertion momentarily, press the ▮▮ PAUSE button. To resume insertion, press the same button again.

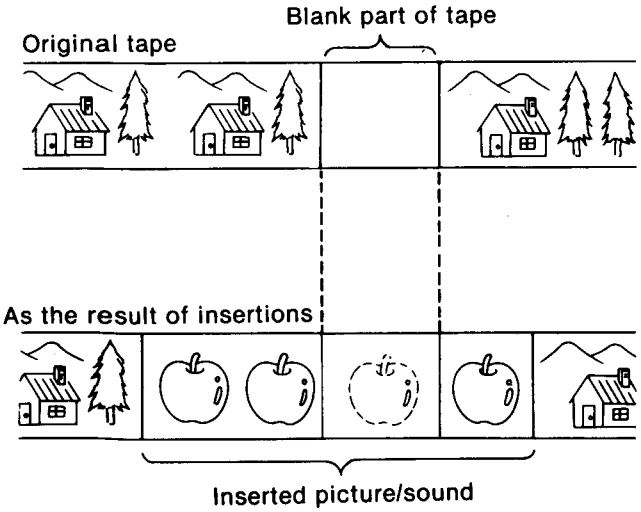
To stop the on-going insertion, press the ■ STOP button.

Monitoring the sound being inserted

- During audio/video insertion, the sound to be listened to can be selected by setting the BETA HI-FI selector and the AUDIO NONITOR selector to the desired position.
- For the sound from the microphone, set the BETA HI-FI selector to NORMAL and listen to the sound through headphones.

Notes

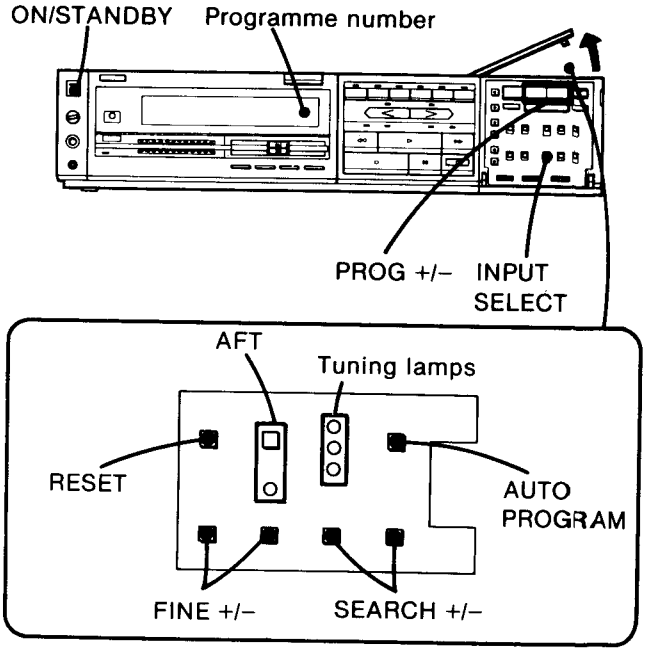
- During insertion, the ● RECORD, ▶ PLAY, ◀◀ REW, ▶▶ FF, FRAME and variable speed playback buttons will not function.
- If a microphone is connected to the MIC jack, the sound from the microphone will always be recorded on the conventional audio track.
- If the safety tab of the cassette has been removed, the cassette will be ejected automatically when the INSERT button is pressed.
- If the video and/or audio insertions are made on the blank space on the original tape, this part will be muted in normal or double-speed playback mode, as there is no control signal recorded.



1-12. TV STATION PROGRAMMING

Automatic and manual programming are available. Automatic programming automatically presets receivable stations from the lowest frequency to the highest. Manual programming is useful for presetting selected stations in any desired sequence.

To start programming, turn on the recorder by pressing the ON/STANDBY switch and set the INPUT SELECT switch to TUNER.



AUTOMATIC PROGRAMMING

Press the AUTO PROGRAM button. Up to 30 receivable stations will be preset one by one from programme position 1. When no more stations can be located, programme number " 1 " will light on the programme indicator and automatic programming will stop.

MANUAL PROGRAMMING

1 Press the + or – PROG button to select the programme position.
  + for a higher-numbered programme position
  – for a lower-numbered programme position

2 Press the + SEARCH button to locate a station with higher frequency and the – SEARCH button to locate a station with lower frequency.
When a station has been received, the search will stop. Press the + or – SEARCH button again, until the desired station is received.

Repeat these steps for all desired stations.

FINE TUNING OF A WEAK STATION

If the picture on a particular programme position is not acceptable, keep the + or – FINE button pressed until the picture becomes clearer. When either of the FINE buttons is pressed, the AFT of the selected station is deactivated and the AFT lamp goes off. To view this particular station, keep the AFT deactivated. (Do not press the AFT button.)
When other memorized stations are selected, the AFT automatically activates.

ELIMINATING NOISE ON UNUSED PROGRAMME POSITIONS

Simply press the RESET button. The annoying noise will be eliminated.

Tuning lamps
The tuning lamp lights to show the current tuning band.
V_L : E2 - E4, E5 - E12 and Cable TV S1 and S2
V_H : Cable TV S3, M1 - M10 and U11 - U20 channels
U : E21 - E68 channels

Note : Cable TV channels are receivable on the SL-HF950ES only.

1-13. CLOCK SETTING

When you connect the mains lead to a mains outlet, the clock indicates "0 : 00" with the two dots blinking.

Time indication

AM			
12 : 00 (midnight)	1 : 00		11 : 00
↓	↓		↓
0:00	1:00	.....	11:00

PM					
12 : 00 (noon)	1 : 00	2 : 00		10 : 00	11 : 00
↓	↓	↓		↓	↓
12:00	13:00	14:00	.....	22:00	23:00

Day indication

MO (Monday)	TU (Tuesday)	WE (Wednesday)	TH (Thursday)	FR (Friday)	SA (Saturday)	SU (Sunday)
↓	↓	↓	↓	↓	↓	↓
1	2	3	4	5	6	7

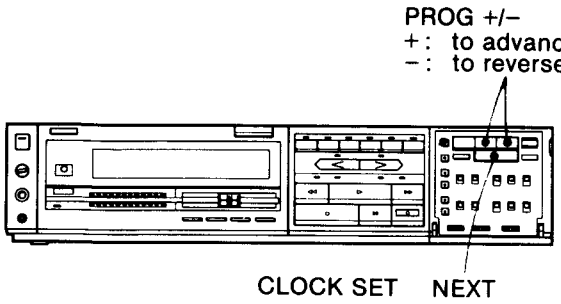
NEXT button
Each time the NEXT button is pressed, the item to be set blinks to let you know the setting order.

+/– buttons
The + and – PROG buttons can be pressed in two ways.

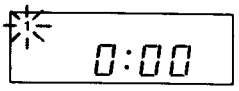
When you hold a button down, the digits will advance continuosly until the button is released.

When you press and immediately release a button, the digits will advance by one.

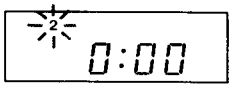
Example: To set the clock to 7:35 p.m. (19:35) on Tuesday



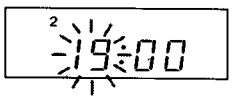
1 Press CLOCK SET for more than a second.



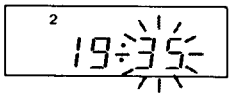
2 Set the day by pressing + or – PROG.



3 Press NEXT and set the hour by pressing + or – PROG.

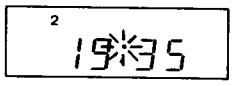


4 Press NEXT and set the minute by pressing + or – PROG.



5 With an announced time signal, press NEXT.
The clock now starts operating, showing the correct time.

The dots of the colon alternately blink every 30 seconds.



Zero second adjustment
Press the CLOCK SET button quickly (for less than a second).
While the upper dot is blinking, the clock is set to the time displayed 00 second. For example, if the clock time is 19:35, it is set to 19:35, 00 second.
While the lower dot is blinking, the clock advances one minute and is set to the time displayed 00 second. For example, if the clock time is 19:35, it is set to 19:36, 00 second.

To change the actual clock setting
Press the CLOCK SET button for more than a second and repeat the clock setting procedure from step 1.

Note
If you have pressed the CLOCK SET button inadvertently, press the NEXT button enough times until the dots of the colon blink.

When the power has been interrupted for more than 30 minutes, the time indication " 0:00 " blinks, showing that the clock must be reset.
If the power has been interrupted for less than 30 minutes, the displayed time remains correct.